

# Main Shaft Assembly for Single-range

## MANUAL TRANSMISSION AND DIFFERENTIAL

### 15. Main Shaft Assembly for Single-range

#### A: REMOVAL

- 1) Remove the manual transmission assembly from the vehicle. <Ref. to 5MT-24, REMOVAL, Manual Transmission Assembly.>
- 2) Remove the transfer case together with the extension case assembly. <Ref. to 5MT-36, REMOVAL, Transfer Case and Extension Case Assembly.>
- 3) Remove the transmission case. <Ref. to 5MT-49, REMOVAL, Transmission Case.>
- 4) Remove the drive pinion shaft assembly. <Ref. to 5MT-57, REMOVAL, Drive Pinion Shaft Assembly.>
- 5) Remove the main shaft assembly for single-range.

#### B: INSTALLATION

- 1) Install the needle bearing and oil seal to the front of the transmission single-range main shaft assembly.

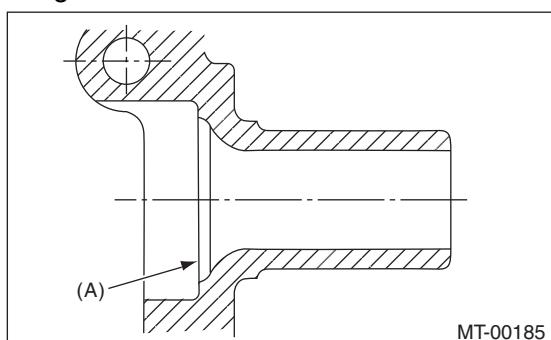
##### NOTE:

- Wrap the clutch splined section with vinyl tape to prevent damage to the oil seal.
- Apply UNILUBE #2 (or equivalent) to the sealing lip of the oil seal.
- Use a new oil seal.

- 2) Install the transmission case knock pin into the knock pin hole of the needle bearing outer race.

##### NOTE:

Align the end face of the seal with surface (A) when installing the oil seal.



- 3) Install the drive pinion assembly. <Ref. to 5MT-57, INSTALLATION, Drive Pinion Shaft Assembly.>

- 4) Install the transmission case. <Ref. to 5MT-50, INSTALLATION, Transmission Case.>

- 5) Install the transfer case together with the extension case assembly. <Ref. to 5MT-36, INSTALLATION, Transfer Case and Extension Case Assembly.>

- 6) Install the manual transmission assembly to the vehicle. <Ref. to 5MT-26, INSTALLATION, Manual Transmission Assembly.>

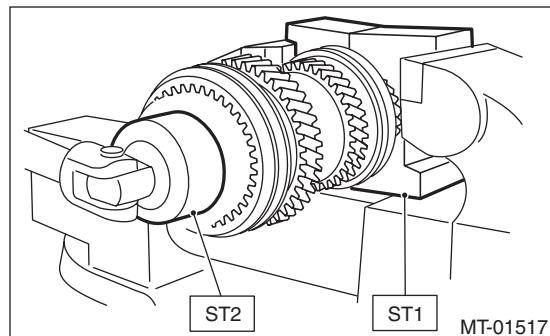
#### C: DISASSEMBLY

- 1) Put vinyl tape around main shaft spline to protect the oil seal from damage. Then pull out the oil seal and needle bearing by hand.
- 2) Remove the lock nut from transmission main shaft assembly for single range.

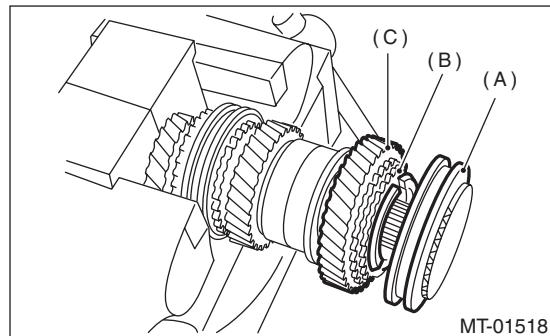
##### NOTE:

Flatten the lock nut tab before removing the lock nut.

ST1 498937000 TRANSMISSION HOLDER  
ST2 499987003 SOCKET WRENCH (35)



- 3) Remove the 5th hub & sleeve No. 2, baulk lever, baulk ring, 5th drive gear & needle bearing.



(A) 5th hub & sleeve No. 2  
(B) Baulk ring  
(C) 5th drive gear

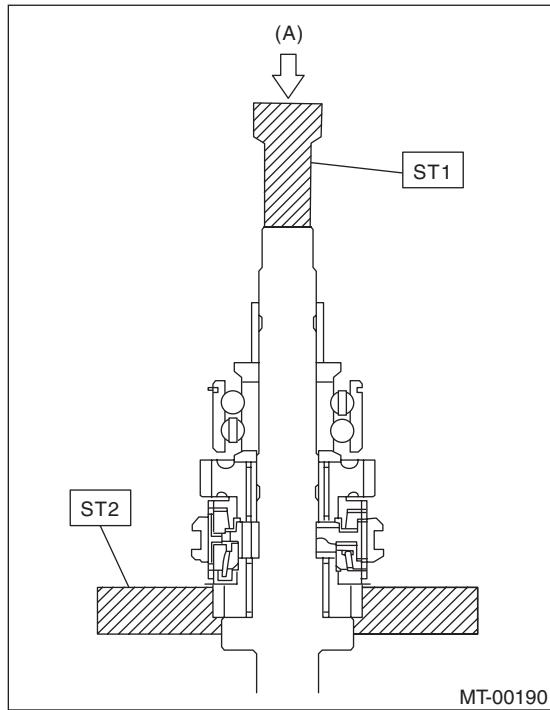
4) Using ST1 and ST2, remove the rest of the parts.

NOTE:

- When replacing the sleeve & hub, replace them as a set.
- Do not disassemble the sleeve & hub; the aligning position is pre-matched.
- If it is necessary to disassemble, mark the engaging points on the splines beforehand.

ST1 899864100 REMOVER

ST2 899714110 REMOVER



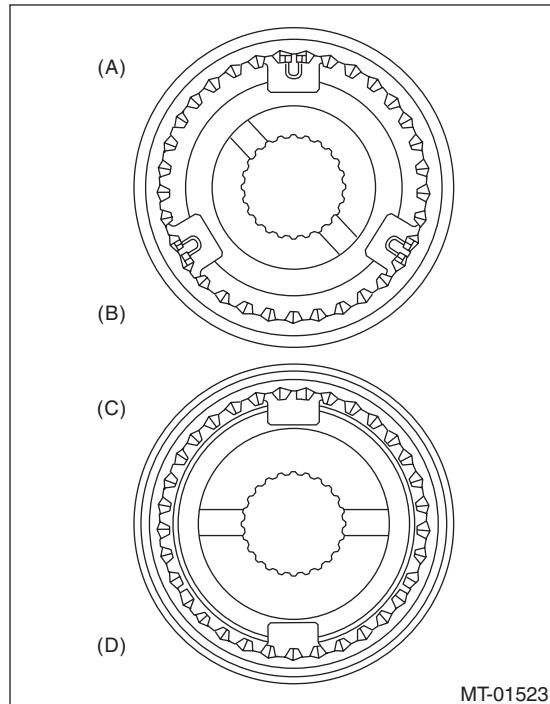
(A) Press

## D: ASSEMBLY

1) When the sleeve & hub assemblies have been disassembled, reassemble by aligning the alignment marks.

NOTE:

Position the open ends of the spring 120° apart.



(A) 3rd-4th hub ASSY

(B) 3rd gear side

(C) 5th hub & sleeve No. 2

(D) 5th gear side

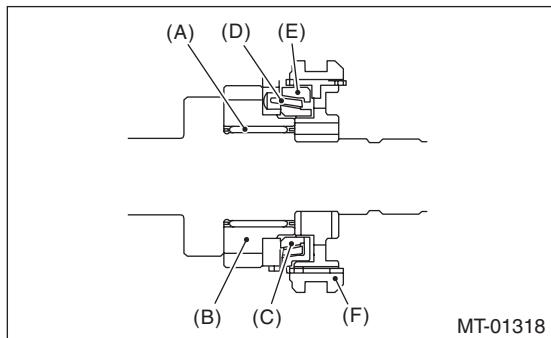
# Main Shaft Assembly for Single-range

## MANUAL TRANSMISSION AND DIFFERENTIAL

2) Install the 3rd drive gear, outer baulk ring, synchro cone, inner baulk ring, sleeve & hub assembly for the 3rd needle bearing, on the transmission main shaft.

**NOTE:**

Align the groove in baulk ring with the shifting insert.



(A) 3rd needle bearing

(B) 3rd drive gear

(C) Inner baulk ring

(D) Synchro cone

(E) Outer baulk ring

(F) Sleeve & hub ASSY

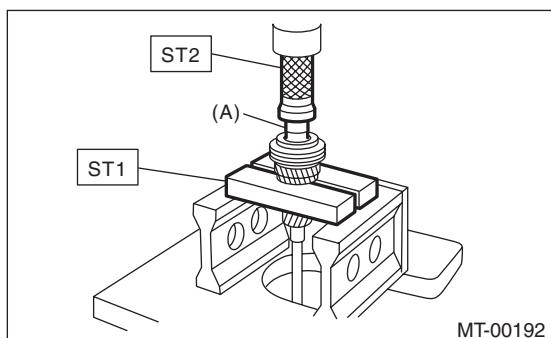
3) Install the 4th needle bearing race onto transmission main shaft using ST1, ST2 and press.

**CAUTION:**

**Do not apply a load in excess of 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).**

ST1 899714110 REMOVER

ST2 499877000 RACE 4-5 INSTALLER

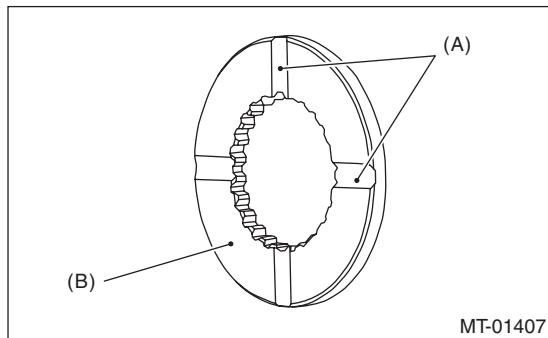


(A) 4th needle bearing race

4) Install the baulk ring, needle bearing, 4th drive gear and 4th gear thrust washer to the transmission main shaft.

**NOTE:**

Align the baulk ring and gear & hub assembly with the key groove.



(A) Groove

(B) 4th gear side

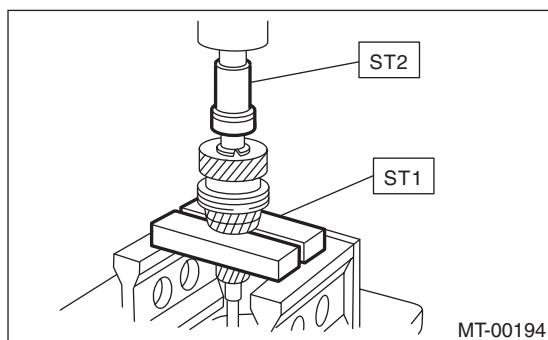
5) Press-fit the ball bearing into the rear section of transmission main shaft using ST1, ST2 and a press.

**CAUTION:**

**Do not apply a load in excess of 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).**

ST1 899714110 REMOVER

ST2 499877000 RACE 4-5 INSTALLER



# Main Shaft Assembly for Single-range

## MANUAL TRANSMISSION AND DIFFERENTIAL

6) Using the ST1 and ST2, install the 5th gear thrust washer and 5th needle bearing race onto the rear section of transmission main shaft.

### CAUTION:

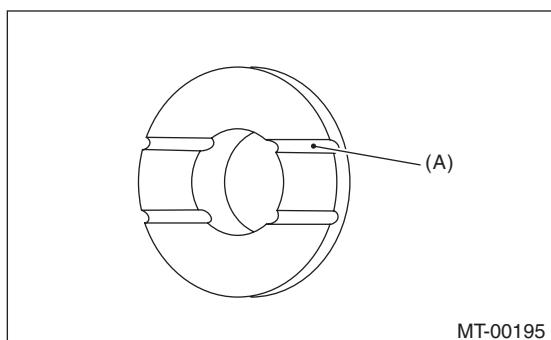
**Do not apply a load in excess of 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).**

### NOTE:

Make sure the thrust washer is oriented in the correct direction.

ST1 899714110 REMOVER

ST2 499877000 RACE 4-5 INSTALLER

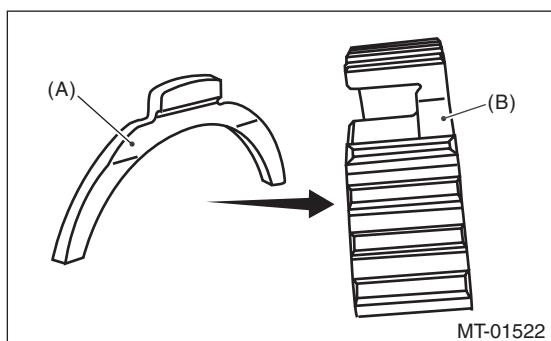


(A) Face this surface to the 5th gear side.

7) Install rest of the parts to the rear section of the transmission main shaft.

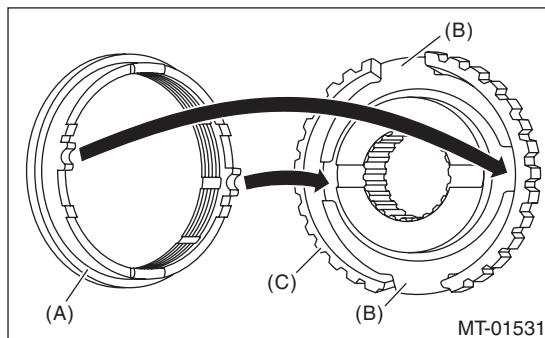
### CAUTION:

**• Install the baulk lever so that the concave side faces toward the 5th hub.**

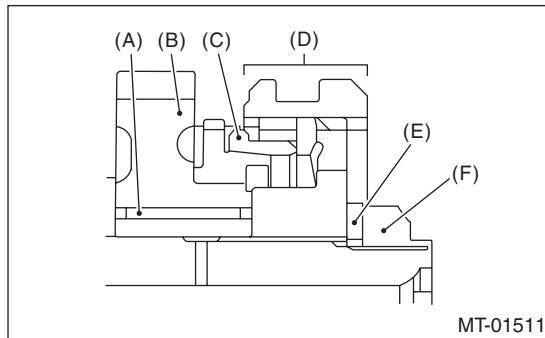


(A) Baulk lever  
(B) 5th hub

- Fit the convex portions of baulk ring with the gaps between baulk levers.**



(A) Baulk ring  
(B) Baulk lever  
(C) 5th hub



(A) Needle bearing  
(B) 5th drive gear  
(C) Baulk ring  
(D) 5th hub & sleeve No. 2  
(E) Lock washer  
(F) Lock nut

8) Tighten the lock nuts to the specified torque using ST1 and ST2.

9) Crimp lock nuts in two locations after tightening.

ST1 499987003 SOCKET WRENCH (35)

ST2 498937000 TRANSMISSION HOLDER

### **Tightening torque:**

**120 N·m (12.2 kgf·m, 88.5 ft-lb)**

# Main Shaft Assembly for Single-range

## MANUAL TRANSMISSION AND DIFFERENTIAL

### E: INSPECTION

Disassembled parts should be washed clean first with cleaning solvent and then inspected carefully.

#### 1) Bearing

Replace the bearings in the following cases.

- When the bearing balls, outer races and inner races are broken or rusty.
- When the bearing is worn.
- When the bearings fail to turn smoothly or emit noise in rotation after gear oil lubrication.
- When bearing has other defects.

#### 2) Bushing (each gear)

Replace the bushing in following cases.

- When the sliding surface is damaged or abnormally worn.
- When the inner wall is abnormally worn.

#### 3) Gear

Replace gears in the following cases.

- Replace gear with new part if its tooth surfaces are broken, damaged or excessively worn.
- Correct or replace if the cone that contacts the baulk ring is rough or damaged.
- Correct or replace if the inner surface or end face is damaged.

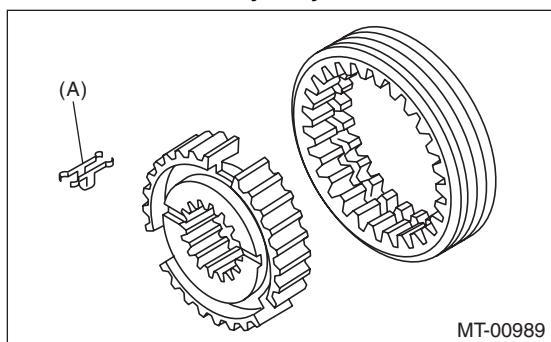
#### 4) Baulk ring

Replace the ring in following cases:

- When the inner surface and end face are damaged.
- When the ring inner surface is abnormally or partially worn down.
- When the contact surface of the synchronizer ring insert is scored or abnormally worn down.

#### 5) Shifting insert key

Replace the insert key if deformed, excessively worn or defective in any way.



(A) Insert key

#### 6) Oil seal

Replace the oil seal if the lip is deformed, hardened, worn or defective in any way.

#### 7) O-ring

Replace the O-ring if the sealing face is deformed, hardened, damaged, worn or defective in any way.

#### 8) Gearshift mechanism

Repair or replace the gearshift mechanism if excessively worn, bent or defective in any way.

### F: ADJUSTMENT

Selection of main shaft rear plate:

Using the ST, measure the protrusion amount (A) of ball bearing from transmission main case surface, and select a suitable plate in the following table.

#### NOTE:

Before measuring, tap the end of main shaft with a plastic hammer lightly in order to make the clearance zero between the main case surface and moving flange of bearing.

ST 498147001 DEPTH GAUGE

Dimension (A) mm (in)	Part number	Mark
4.00 — 4.13 (0.1575 — 0.1626)	32294AA041	1
3.87 — 3.99 (0.1524 — 0.1571)	32294AA051	2

